Scenario:

Trees are one of the main staples in the agricultural world. Trees provide shade, they filter our air from pollution, and they serve as natural habitats for different animals. Trees provide us with an unimaginable amount of services such as paper, plywood, and lumber. Trees can also be used for art, allowing us to make beautiful wood sculptures. Just about everybody has wood somewhere in their house, whether it is their bed or an end table, majority of the time both are made from wood and both originated from some type of tree. How do we keep our trees healthy? Is there some way that we can help our trees remain healthy? Are there ways for us to be able to help trees reach their marketable potential?

Today you will be able to find out the process of how some forestry companies keep their trees strong. A lot of farmers who are in the forestry industry also use these techniques to make their tree stand as strong as possible to be able to make a profit. Government agencies are also contracted to perform these services for farmers as well. Today you will be developing a conservation plan for a local tree farmer. The class will go to a landowner’s private land and survey his tree stand. You will conduct tree identifications, forest stand thinning, measure the height of a tree, and take the basal area of a stand. You will be separated within teams of three. Each team will have someone to record what you are doing with some form of digital device, another person within the group will utilize an iPad to develop some form of graph that tells the percentage of the variety of trees within the stand, and someone will be taking pictures to develop a photo essay and the different types of trees and a few brief facts about them once we return to the classroom. The best conservation plan will be chosen to be implemented on the landowner’s property.

Task:

1. As a group, you will identify the different trees in the stand. Knowing the different trees will allow you to determine which trees will be more beneficial in obtaining a profit. Record the different number of trees and build a graph with the data utilizing an iPad.
2. You will conduct a tree thinning operation to remove the unwanted trees. Keep the best and remove the rest!
3. Each group will obtain the height of a designated tree.
4. Each group will obtain the basal area of a designated plot of trees.
5. While performing these objectives, a member of each group will be recording and taking pictures to compile a photo essay for reviewing.
6. Once back at the classroom each group will construct an aerial photo map utilizing ArcGIS program.

Related Websites to help you out

<http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

<http://www.extension.iastate.edu/forestry/iowa_trees/tree_id.html>

<http://forestry.usu.edu/htm/kids-and-teachers/tree-height-measurement>

<http://www.farmforestline.com.au/pages/6.3.1_stand_basal.html>

Teacher Notes

This activity will be for the last 1.5 weeks of school. This exercise will be a culmination of every unit that was covered in class.

1. Tree Identification
2. Tree Height Measurement
3. Basal Area
4. Tree Thinning
5. Using ArcGIS

This assignment is meant to be an exercise that utilizes the skills and knowledge base that the students have obtained during the course of the semester.

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| --- | --- |
| Day 1 | Meeting with the Landowner |
| Day 2 | Go out to landowner’s property for observation  Preliminary Inventory |
| Day 3 | Receive equipment |
| Day 4 | Tree Identification  Tree Height Measurement  Basal Area  Tree Thinning |
| Day 5 | Construct Conservation Plan using ArcGIS |
| Day 6 | Finish Conservation Plan |
| Day 7 | Present Plan to Landowner  Develop Photo Essay |
| Day 8 | Conservation Plan will be chosen for Landowner |

Goals­­

1. Students collaborate to develop a comprehensive conservation plan for forestry.
2. Utilize several technologies to accomplish goals.

Learning Goals

Iowa Core Standards and Benchmarks

1. Students can understand and apply concepts and procedures of algebra.
2. Students can understand and apply concepts of measurement.
3. Students can understand and apply concepts of estimation.
4. Students can analyze and interpret scientific information.
5. Students can understand life cycles

8 Pedagogical Decisions

1. Students centered.
2. Convergent thinking to perform a practical exercise.
3. Requires extensive prior knowledge in subject matter to accomplish goals.
4. This exercise will require deep knowledge of the content.
5. This exercise will take 8 days to complete.
6. This exercise is based on more structured learning.
7. Groups of 3 will be sufficient.
8. Multiple additional resources will be needed

Activity Types

1. View: Students are needed to view and interpret aerial photo maps, live trees, know how to read a tree measuring stick, and a gauge.
2. Record: Students will need to record audio imagery.
3. Create a Film: Students will need to create an audio/video essay.
4. Analyze Data:
5. Take Notes: Students will need to be able to take accurate notes while recording data.
6. View Images/Objects: Students will need to be able to interpret aerial photos.
7. Record Data: Students will need to record information about the variety of trees that are on the landowner’s property.
8. Collect Data: Students will need to collect data and create some form of graph representing the variety of trees on the landowner’s property.

Assessment Strategies

Students will take a test to assess that learning has occurred during the course of this semester.

1. Draw and label a diagram of the different parts of a tree leaf.
2. Name five common trees in Iowa.
3. Give a brief description of the anatomy of a tree.
4. Explain how to measure the height of a tree.
5. Explain how to take the basal area of a stand of trees.

Tools Utilized

1. ArcGIS
2. Internet
3. IPad Map Services
4. Some form of digital recording device
5. Yodio, PhotoPeach, Fotobabble
6. Google Docs